
7. TRANSPORTATION AND PARKING

This EIR chapter describes the existing and projected transportation conditions in the project vicinity, analyzes potential impacts of the project on the operation of that system, and recommends mitigation measures for the identified significant impacts. This chapter of the EIR is based on the *Downtown Sunnyvale Improvement Program Transportation Impact Analysis Study* completed for the City of Sunnyvale in December 2002 by CCS Planning and Engineering, the *Downtown Urban Design Plan Traffic Issues and Recommendations* report completed for the City in December 2001 by Fehr & Peers Associates, and the *Comprehensive Countywide Expressway Study* completed for the Santa Clara Valley Transportation Authority (TVA) in March 2003 by CCS Planning and Engineering. Background information used in creating this EIR chapter is available for review at the City of Sunnyvale Department of Community Development, 456 West Olive Avenue, Sunnyvale.

7.1 SETTING

This section describes the existing transportation system serving downtown Sunnyvale, which consists of a network of regional roadways (freeways and highways), local roadways, transit services and pedestrian and bicycle facilities. Existing roadway system traffic volumes and intersection operations are also described.

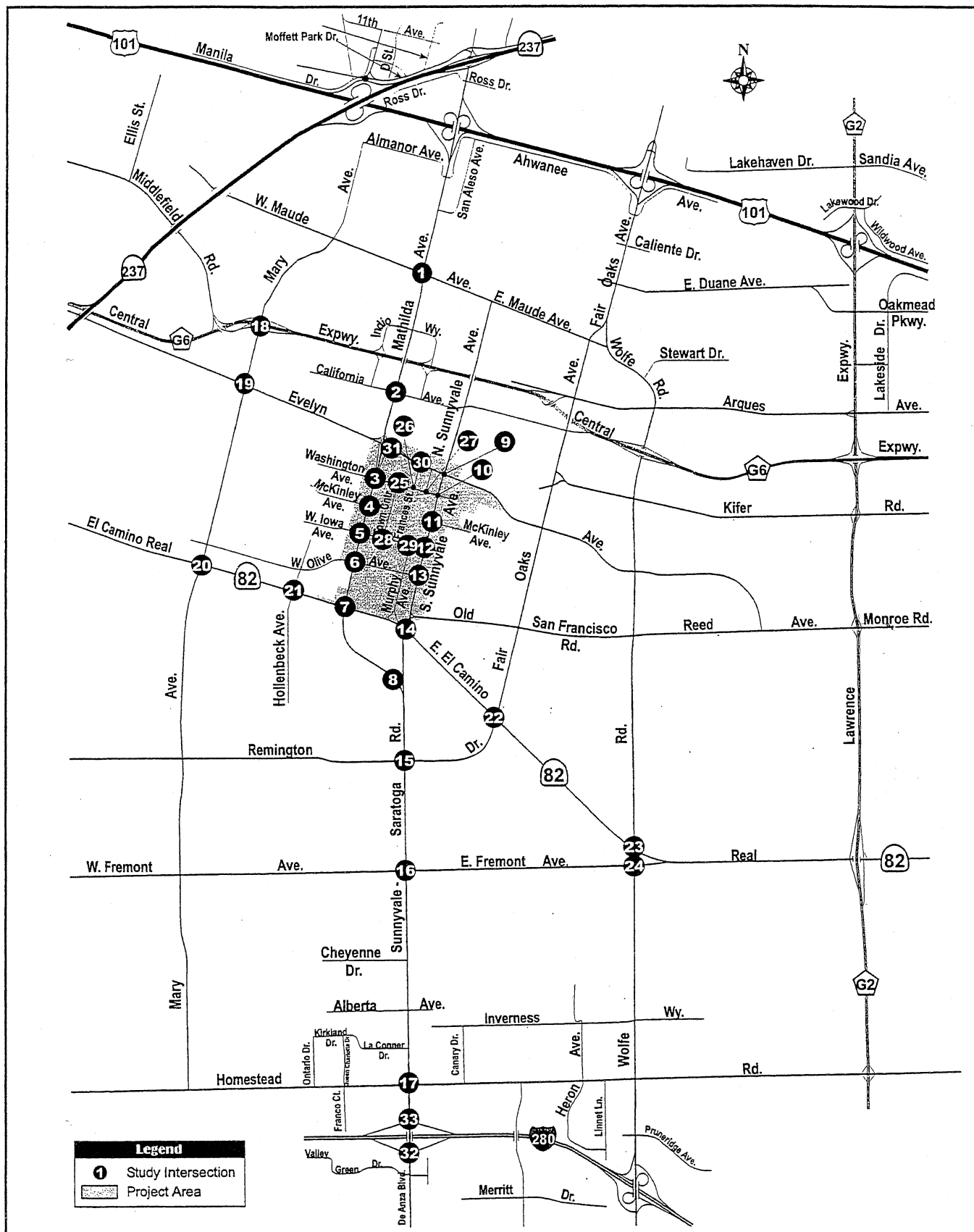
7.1.1 Existing Roadway Network

Figure 7.1 illustrates the existing roadway network serving the project area and vicinity.

(a) Regional Access. Regional access to the project area is provided by U.S. 101, Interstate 280 (I-280), State Route 237 (SR 237), and State Route 85 (SR 85).

U.S. 101 is an eight-lane freeway that extends from Northern California through San Francisco to San Jose, southern Santa Clara County, and Southern California. Three mixed-flow (i.e., unrestricted) lanes and one high-occupancy vehicle (HOV) (i.e., car pool) lane are provided in each direction on U.S. 101 through Sunnyvale, with complete interchanges at SR 237, Mathilda Avenue, Fair Oaks Avenue, and the Lawrence Expressway. Also, a northbound on-ramp is located on Moffett Park Drive/Manila Drive west of the SR 237 interchange. U.S. 101 south of Mathilda Avenue currently carries approximately 158,000 vehicles per day.¹

¹Caltrans, <http://www.dot.ca.gov/>, 2001.



SOURCE: CCS Planning and Engineering, Inc.

Figure 7.1

LOCAL ROADWAY SYSTEM

I-280 is an eight-lane freeway (three mixed-flow lanes and one HOV lane in each direction) that extends from San Francisco in the north to San Jose in the south. Near Sunnyvale, there are interchanges at SR 85, De Anza Boulevard, and Wolfe Road. *I-280* south of De Anza Boulevard currently carries approximately 150,000 vehicles per day.¹

SR 237 is a four- to six-lane freeway that provides access between SR 82 (El Camino Real) to the west and I-880 to the east. East of Mathilda Avenue, SR 237 has two mixed-flow lanes and one HOV lane in each direction. West of Mathilda Avenue, SR 237 has two mixed-flow lanes in each direction. SR 237 provides regional access to several local major roadways in Sunnyvale including Mathilda Avenue, Maude Avenue, the Central Expressway, and the Lawrence Expressway. SR 237 east of Mathilda Avenue carries approximately 91,000 vehicles per day.²

SR 85 is a six-lane freeway (two mixed-flow lanes and one HOV lane in each direction) that extends from U.S. 101 in Mountain View to a southern connection with U.S. 101 in south San Jose. SR 85 north of El Camino Real currently carries approximately 106,000 per day.³

(b) Local Access. Local arterial access to and within the project area is provided by Mathilda Avenue, Sunnyvale Avenue, and El Camino Real (SR 82).

Mathilda Avenue is a north-south arterial roadway providing direct access to downtown Sunnyvale, with at least six lanes over its length between the Moffett Park area in north Sunnyvale and El Camino Real in south Sunnyvale. Mathilda Avenue is divided by a median and has a speed limit of 45 miles per hour (mph). At its southern end, Mathilda Avenue intersects with Sunnyvale-Saratoga Road and continues as a six-lane arterial that provides access to I-280 and SR 85.

Sunnyvale Avenue is a north-south arterial roadway between El Camino Real and Maude Avenue that provides direct access to downtown Sunnyvale. South of El Camino Real, Sunnyvale Avenue continues as Sunnyvale-Saratoga Road.

El Camino Real (SR 82) is a six-lane, divided roadway that runs from San Francisco in the north to Santa Clara in the south, and provides direct access to downtown Sunnyvale.

¹Ibid.

²Ibid.

³Ibid.

7.1.2 Roadway Analysis Methodology

(a) Study Intersections and Road Segments. Study intersections and road segments selected for analysis in this EIR chapter, in consultation with the City of Sunnyvale Department of Public Works, are as follows (see Figure 7.1 for locations):

Study Intersections:

1. Mathilda Avenue and Maude Avenue *
2. Mathilda Avenue and California Avenue
3. Mathilda Avenue and Washington Avenue
4. Mathilda Avenue and McKinley Avenue
5. Mathilda Avenue and Iowa Avenue
6. Mathilda Avenue and Olive Avenue
7. Mathilda Avenue and El Camino Real *
8. Mathilda Avenue and Talisman Drive
9. Sunnyvale Avenue and Evelyn Avenue
10. Sunnyvale Avenue and Washington Avenue
11. Sunnyvale Avenue and McKinley Avenue
12. Sunnyvale Avenue and Iowa Avenue
13. Sunnyvale Avenue and Olive Avenue
14. Sunnyvale Avenue and El Camino Real
15. Sunnyvale-Saratoga Road and Remington Drive *
16. Sunnyvale-Saratoga Road and Fremont Avenue *
17. De Anza Boulevard and Homestead Road *
18. Mary Avenue and Central Expressway *
19. Mary Avenue and Evelyn Avenue
20. Mary Avenue and El Camino Real *
21. El Camino Real and Hollenbeck Avenue
22. El Camino Real and Remington Drive
23. El Camino Real and Wolfe Road *
24. Wolfe Road and Fremont Avenue
25. Washington Avenue and Town Center Lane
26. Washington Avenue and Frances Street (Unsignalized)
27. Washington Avenue and Murphy Avenue (Unsignalized)
28. Iowa Avenue and Town Center Lane
29. Iowa Avenue and Murphy Avenue
30. Evelyn Avenue and Frances Street
31. Evelyn Avenue and Agena Way
32. De Anza Boulevard and I-280 Southbound Ramps *
33. De Anza Boulevard and I-280 Northbound Ramps. *

* Denotes Congestion Management Program (CMP) intersection.

Study Neighborhood Street Segments:

1. Washington Avenue west of Mathilda Avenue
2. Iowa Avenue west of Mathilda Avenue
3. McKinley Avenue east of Sunnyvale Avenue
4. Olive Avenue east of Sunnyvale Avenue
5. Taaffe Street south of Iowa Avenue
6. Frances Street south of Iowa Avenue
7. Murphy Avenue south of Iowa Avenue.

Study Freeway Segments:

1. U.S. 101 between Montague Expressway and Shoreline Boulevard
2. SR 237 between El Camino Real and First Street
3. SR 85 between I-280 and U.S. 101
4. I-280 between SR 85 and Wolfe Road.

Study intersection and roadway segment operations were evaluated during the morning (AM) and evening (PM) peak hours.

(b) Roadway Evaluation Scenarios. The study intersections and freeway segments identified in subsection (a) above were evaluated for each of the following three scenarios:

Scenario 1: *Existing Conditions.* Existing traffic conditions have been evaluated based on existing traffic volume information obtained from field counts of peak one-hour traffic conditions during the morning and evening commute periods.

Scenario 2: *Year 2020 No Project (Current General Plan) Conditions.* This scenario represents projected year 2020 traffic volume conditions without the proposed Downtown Improvement Program Update project. The scenario includes existing traffic volumes plus traffic from approved developments in the project vicinity plus traffic anticipated with projected citywide General Plan buildout including buildout under the City-approved 1993 Downtown Specific Plan, with planned and funded roadway modifications in place, but not including the buildout increment anticipated under the proposed project.

Scenario 3: *Year 2020 Project (Downtown Improvement Program Update) Conditions.* This scenario represents projected year 2020 traffic volume conditions (Scenario 2) plus traffic increment generated by added central area growth facilitated by the proposed Downtown Improvement Program Update project.

- ***Scenario 3 Plus Moffett Park Development.*** In addition, because the City is currently also considering possible development alternatives for the Moffett Park site to the north, a development prospect which could also substantially affect cumulative future traffic conditions, this EIR evaluation includes a variation on Scenario 3 with the addition of the

anticipated traffic increment from the City-identified "preferred alternative" for the Moffett Park development ("Scenario 3 Plus Moffett Park Development").

7.1.3 Scenario 1: Existing Roadway System Conditions

(a) Existing Traffic Volumes and Lane Configurations. Study intersection and freeway segment operations were evaluated for morning (AM) and evening (PM) peak traffic conditions. Field counts indicate that peak conditions generally occur during the morning and evening commute hours of 7:00 to 9:00 AM and 4:00 to 6:00 PM, respectively.

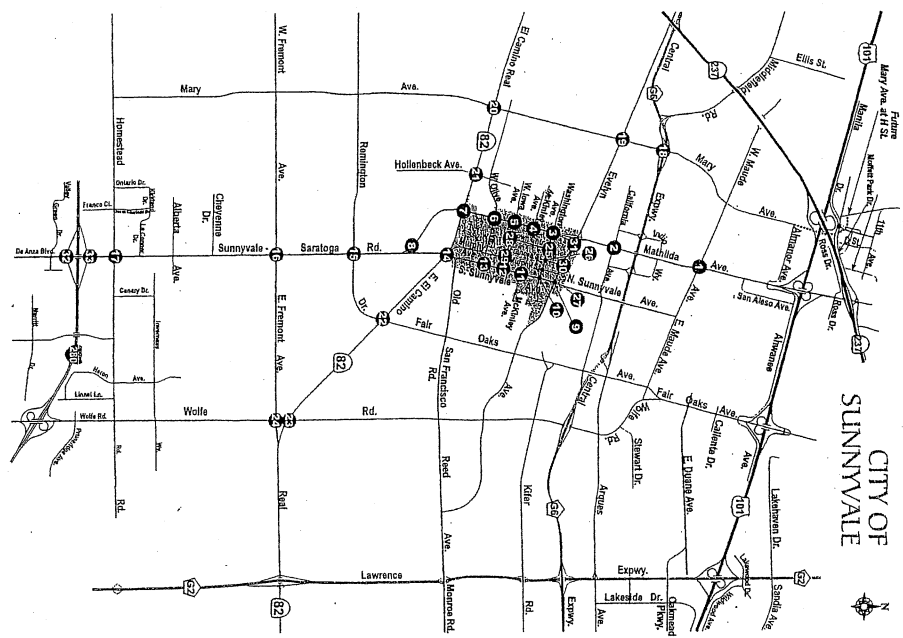
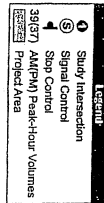
Freeway Segment Volumes. Peak-hour freeway segment volumes were obtained from the *2001 Monitoring and Conformance Report* (Congestion Management Program, Valley Transportation Authority).

Intersection Volumes. Turning movement counts at the study intersections during the morning and evening peak periods were compiled from a variety of sources. CCS Planning and Engineering, conducted traffic counts at most of the study intersections in 2001 and 2002. Traffic counts at other locations in and near downtown Sunnyvale were taken from various local transportation impact studies. The traffic count data are included in appendix A of the *Downtown Sunnyvale Improvement Program Transportation Impact Analysis Study*, completed by CCS Planning and Engineering in December 2002 and available for review at the City of Sunnyvale Department of Community Development, 456 West Olive Avenue, Sunnyvale. The existing peak-hour traffic volumes based on this count data and on existing lane geometry at the study intersections are shown on Figure 7.2.

(b) Existing Roadway System "Levels of Service." Existing operations of study freeway segments and study intersections were evaluated using *Level of Service (LOS)* calculations. *Level of Service* is a qualitative description of freeway segment's or intersection's operation. Based on the LOS calculation results, levels of service ratings are applied, ranging from LOS A, representing free-flow conditions, to LOS F, representing oversaturated conditions.

Freeway Segment Level of Service Definitions. The level of service analyses of freeway segments were completed based on the computation procedures recommended in the Transportation Research Board's *1994 Highway Capacity Manual*. The level of service criteria applied are summarized in Table 7.1.

Existing levels of service for the study area freeway segments were taken from the *2001 Monitoring and Conformance Report* published annually by the VTA. The density was determined by counting the number of vehicles on each freeway segment from aerial photographs of the county freeways taken during peak hours. The VTA determined the prevailing speed of traffic on these freeway segments by calibrating the data with appropriate speed-density curves. Table 7.2 summarizes the results of the freeway segment modeling.



<p>1</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>2</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>3</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>4</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>5</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>6</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>7</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>8</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>9</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>10</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>11</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>12</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>13</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>14</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>15</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>16</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>17</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>18</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>19</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>20</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>21</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>22</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>23</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>24</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>25</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>26</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>27</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>28</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>29</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>30</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>31</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>32</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>	<p>33</p> <p>118(336) 127(77)</p> <p>5(43) 1(37)</p>
--	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

PROJECT: 2007-01-01

SOURCE: CCS Planning and Engineering

Figure 7.2
EXISTING PEAK-HOUR INTERSECTION
VOLUMES AND LANE GEOMETRY

Table 7.1

LEVEL OF SERVICE DEFINITIONS FOR FREEWAY SEGMENTS

<u>Level of Service</u>	<u>Density (vehicles/mile/lane)</u>
A	Density < 10.0
B	10.0 < Density < 16.0
C	16.0 < Density < 24.0
D	24.0 < Density < 46.0
E	46.0 < Density < 55.0
F	55.0 < Density

SOURCE: *Transportation Impact Analysis Guidelines* (Santa Clara VTA, 1996), CCS Planning and Engineering, November 2001.

Table 7.2
EXISTING (2000) FREEWAY OPERATIONS

Freeway	Segment	Lanes	Capacity	AM Peak Hour		PM Peak Hour	
				Existing Trips	LOS	Existing Trips	LOS
101 NB	South of Montague Expwy.	3 Mixed ¹	6,900	5,460	F	5,940	B
		1 HOV ²	2,300	1,790	E	850	A
	Montague Expwy. to Bower Ave.	3 Mixed	6,900	6,300	D	5,940	C
		1 HOV	2,300	2,040	C	1,110	A
	Bower Ave. to Lawrence Expwy.	3 Mixed	6,900	5,940	C	6,600	C
		1 HOV	2,300	1,860	B	850	A
	Lawrence Expwy. to Fair Oaks Ave.	3 Mixed	6,900	4,860	A	5,220	B
		1 HOV	2,300	1,170	A	1,040	A
	Fair Oaks Ave. to Mathilda Ave.	3 Mixed	6,900	6,770	D	4,500	A
		1 HOV	2,300	1,440	A	910	A
	Mathilda Ave. to Route 237	3 Mixed	6,900	4,740	F	5,040	B
		1 HOV	2,300	1,790	F	1,200	A
	Route 237 to Ellis St.	3 Mixed	6,900	3,960	F	4,500	F
		1 HOV	2,300	1,440	F	1,380	A
	Ellis St. to Moffett Blvd.	3 Mixed	6,900	3,960	F	4,500	F
		1 HOV	2,300	1,440	F	1,380	A
101 SB	Moffett Blvd. to Route 85	3 Mixed	6,900	3,690	F	4,550	F
		1 HOV	2,300	1,340	F	1,960	E
	Route 85 to Shoreline Blvd.	3 Mixed	6,900	4,200	F	4,350	F
		1 HOV	2,300	2,100	D	1,320	A
	North of Shoreline Blvd.	3 Mixed	6,900	4,500	F	4,500	F
		1 HOV	2,300	2,200	D	1,980	B
	North of Shoreline Blvd.	3 Mixed	6,900	4,260	F	3,870	F
		1 HOV	2,300	1,980	C	2,040	C
	Shoreline Blvd. to Route 85	3 Mixed	6,900	5,460	F	5,360	E
		1 HOV	2,300	1,930	B	1,800	B
	Route 85 to Moffett Blvd.	3 Mixed	6,900	6,900	D	5,940	C
		1 HOV	2,300	1,800	B	1,440	A
	Moffett Blvd. to Ellis St.	3 Mixed	6,900	4,950	F	5,940	C
		1 HOV	2,300	1,620	A	1,260	A
	Ellis St. to Route 237	3 Mixed	6,900	4,950	F	5,940	C
		1 HOV	2,300	1,620	A	1,260	A
	Route 237 to Mathilda Ave.	3 Mixed	6,900	6,450	D	5,220	B
		1 HOV	2,300	1,680	B	1,320	A
	Mathilda Ave. to Fair Oaks Ave.	3 Mixed	6,900	6,300	D	3,360	F
		1 HOV	2,300	1,680	B	1,040	A

Notes:

- ¹ Mixed = mixed-flow (unrestricted) lane.
² HOV = high-occupancy vehicle (car pool) lane.

Table 7.2 (continued)

Freeway	Segment	Lanes	Capacity	AM Peak Hour Existing Trips	LOS	PM Peak Hour Existing Trips	LOS
237 EB	Fair Oaks Ave. to Lawrence Expwy.	3 Mixed	6,900	5,880	E	4,050	F
		1 HOV	2,300	1,740	B	1,170	A
	Lawrence Expwy. to Bower Ave.	3 Mixed	6,900	5,880	E	3,210	F
		1 HOV	2,300	780	A	1,860	B
	Bower Ave. to Montague Expwy.	3 Mixed	6,900	5,760	B	3,840	F
		1 HOV	2,300	1,040	A	1,560	F
	South of Montague Expwy.	3 Mixed	6,900	4,680	A	3,480	F
		1 HOV	2,300	850	A	1,380	F
	West of Route 85 (to El Camino Real)	2 Total (Mixed)	4,600	2,760	A	2,760	A
		1 (HOV)	2,300	488	A	687	B
	Route 85 to Central Expwy.	2 Total (Mixed)	4,600	2,960	F	2,470	A
		1 (HOV)	2,300	841	B	356	A
	Central Expwy. to Maude Ave.	2 Total (Mixed)	4,600	3,180	F	1,690	A
		1 (HOV)	2,300	774	B	518	A
	Maude Ave. to US 101	2 Total (Mixed)	4,600	3,250	F	1,690	A
		1 (HOV)	2,300	559	A	340	A
	U.S. 101 to Mathilda Ave.	2 Total (Mixed)	4,600	2,610	F	2,760	A
		1 (HOV)	2,300	386	A	408	A
	Mathilda Ave. to Fair Oaks Ave.	2 Mixed	4,600	3,400	F	2,400	A
		1 HOV	2,300	1,620	A	650	A
	Fair Oaks Ave. to Lawrence Expwy.	2 Mixed	4,600	4,500	D	2,520	A
		1 HOV	2,300	2,040	B	460	A
	Lawrence Expwy. to Great America Pkwy.	2 Mixed	4,600	3,180	F	3,120	A
		1 HOV	2,300	1,680	B	850	A
	Great America Pkwy. to N. First St.	2 Mixed	4,600	3,640	F	3,480	B
		1 HOV	2,300	1,170	A	1,040	A
	East of N. First St.	2 Mixed	4,600	3,960	B	3,350	F
		1 HOV	2,300	910	A	910	A
237 WB	East of N. First St.	2 Mixed	4,600	4,300	D	3,850	B
		1 HOV	2,300	1,560	A	590	A
	N. First St. to Great America Pkwy.	2 Mixed	4,600	3,850	B	4,230	E
		1 HOV	2,300	1,740	B	850	A
	Great America Pkwy. to Lawrence Expwy.	2 Mixed	4,600	3,240	A	4,070	C
		1 HOV	2,300	1,380	A	460	A
	Lawrence Expwy. to Fair Oaks Ave.	2 Mixed	4,600	3,480	B	3,960	B
		1 HOV	2,300	1,800	B	1,240	A
	Fair Oaks Ave. to Mathilda Ave.	2 Total (Mixed)	4,600	3,950	A	4,430	B
		1 (HOV)	2,300	766	B	714	B
	Mathilda Ave. to U.S. 101	2 Total (Mixed)	4,600	3,720	B	4,180	C
		1 (HOV)	2,300	567	A	582	A

Notes:

¹ Mixed = mixed-flow (unrestricted) lane.

Table 7.2 (continued)

Freeway	Segment	Lanes	Capacity	AM Peak Hour		PM Peak Hour	
				Existing Trips	LOS	Existing Trips	LOS
85 NB	U.S. 101 to Maude Ave.	2 Total (Mixed) 1 (HOV)	4,600	3,120	A	4,290	G
	Maude Ave. to Central Expwy.	2 Total (Mixed) 1 (HOV)	2,300 4,600	615 1,690	A A	712 2,820	B F
	Central Expwy. to Route 85	2 Total (Mixed) 1 (HOV)	2,300 4,600	435 2,640	A A	465 3,320	F F
	West of Route 85 (to El Camino Real)	2 Total (Mixed) 1 (HOV)	2,300 4,600	602 3,960	A C	463 3,450	A F
	South of I-280	2 Mixed 1 HOV	4,600 2,300	900	B	467	A
	I-280 to Homestead Rd.	2 Mixed 1 HOV	4,600 2,300	2,320	F	1,690	A
	Homestead Rd. to Fremont Blvd.	2 Mixed 1 HOV	4,600 2,300	910	A	330	A
	Fremont Blvd. to El Camino Real	2 Mixed 1 HOV	4,600 2,300	3,660	F	2,340	A
	El Camino Real to Route 237	2 Mixed 1 HOV	2,300 4,600	2,040	B	260	A
	Route 237 to Central Expwy.	2 Mixed 1 HOV	4,600 2,300	2,280	F	4,080	B
	North of Central Expwy. (to U.S. 101)	2 Mixed 1 HOV	2,300 4,600	1,680	B	390	A
		2 Mixed 1 HOV	4,600 2,300	3,450	F	3,000	A
		2 Mixed 1 HOV	2,300 4,600	1,040	A	260	A
85 SB	North of Central Expwy. (to U.S. 101)	2 Mixed 1 HOV	4,600 2,300	4,320	E	1,950	A
	Central Expwy. To Route 237	2 Mixed 1 HOV	2,300 4,600	590	A	130	A
	Route 237 to El Camino Real	2 Mixed 1 HOV	4,600 2,300	3,850	B	2,340	A
	El Camino Real to Fremont Blvd.	2 Mixed 1 HOV	2,300 4,600	1,110	A	260	A
	Fremont Blvd. to Homestead Rd.	2 Mixed 1 HOV	4,600 2,300	3,160	F	2,080	A
	Homestead Rd. to I-280	2 Mixed 1 HOV	2,300 4,600	980	A	520	A
	South of I-280	2 Mixed 1 HOV	4,600 2,300	1,560	A	3,450	F
	West of Route 85	3 Mixed 1 HOV	6,900 2,300	780	A	780	A
	Route 85 to De Anza Blvd.	3 Mixed 1 HOV	6,900 2,300	1,950	A	2,420	F
		3 Mixed 1 HOV	6,900 2,300	1,110	A	1,170	A
		3 Mixed 1 HOV	6,900 2,300	3,000	A	2,740	F
		3 Mixed 1 HOV	6,900 2,300	1,170	A	1,560	A
		3 Mixed 1 HOV	6,900 2,300	2,640	A	3,000	F
I-280 EB	Fremont Blvd. to Homestead Rd.	2 Mixed 1 HOV	4,600 2,300	1,200	A	1,800	B
	Homestead Rd. to I-280	2 Mixed 1 HOV	4,600 2,300	4,180	C	2,750	F
	South of I-280	2 Mixed 1 HOV	4,600 2,300	850	A	1,500	A
	West of Route 85	3 Mixed 1 HOV	6,900 2,300	1,690	A	4,070	C
	Route 85 to De Anza Blvd.	3 Mixed 1 HOV	6,900 2,300	1,560	A	910	A
		3 Mixed 1 HOV	6,900 2,300	2,700	A	4,260	F
		3 Mixed 1 HOV	6,900 2,300	260	A	1,440	A
		3 Mixed 1 HOV	6,900 2,300	6,120	B	4,920	F
		3 Mixed 1 HOV	6,900 2,300	330	A	1,380	A
		3 Mixed 1 HOV	6,900 2,300	5,780	B	4,280	F
		3 Mixed 1 HOV	6,900 2,300	390	A	1,170	A
		3 Mixed 1 HOV	6,900 2,300				
		3 Mixed 1 HOV	6,900 2,300				

Notes:

¹ Mixed = mixed-flow (unrestricted) lane.

Table 7.2 (continued)

Freeway	Segment	Lanes	Capacity	AM Peak Hour Existing Trips	LOS	PM Peak Hour Existing Trips	LOS
I-280 WB	De Anza Blvd. to Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	6,440 520	C A	4,500 1,260	F A
	East of Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	5,400 780	B A	6,750 1,320	D A
	East of Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	4,260 2,150	F C	5,580 520	B A
	Wolfe Rd. to De Anza Blvd.	3 Mixed 1 HOV	6,900 2,300	4,650 1,740	F B	5,760 720	B A
	De Anza Blvd. to Route 85	3 Mixed 1 HOV	6,900 2,300	5,940 850	B A	4,500 520	A A
	West of Route 85	3 Mixed 1 HOV	6,900 2,300	4,950 1,440	F A	5,940 460	C A

SOURCE: CCS Planning and Engineering, December 2002.

Notes:

¹ Mixed = mixed-flow (unrestricted) lane.

² HOV = high-occupancy vehicle (car pool) lane.

As indicated by Table 7.2, the following freeway segments in the study area operate at LOS F during at least one peak hour under existing conditions:

- U.S. 101 northbound between SR 237 and Ellis Street in both the AM and PM peak hours
- U.S. 101 northbound between Ellis Street and Moffett Boulevard in both the AM and PM peak hours
- U.S. 101 northbound between Moffett Boulevard and SR 85 in both the AM and PM peak hours
- U.S. 101 northbound between SR 85 and Shoreline Boulevard in the AM peak hour
- U.S. 101 northbound north of Shoreline Boulevard in both the AM and PM peak hours
- U.S. 101 southbound north of Shoreline Boulevard in both the AM and PM peak hours
- U.S. 101 southbound between Bowers Avenue and Montague Expressway in the PM peak hour
- U.S. 101 southbound south of Montague Expressway in the PM peak hour
- SR 237 eastbound between SR 85 and Central Expressway in the AM peak hour
- SR 237 eastbound between U.S. 101 and Mathilda Avenue in the AM peak hour
- SR 237 eastbound between Mathilda Avenue and Fair Oaks Avenue in the AM peak hour
- SR 237 eastbound between Lawrence Expressway and Great America Parkway in the AM peak hour
- SR 237 westbound between Central Expressway and SR 85 in the PM peak hour
- SR 237 westbound between SR 85 and El Camino Real in the PM peak hour
- SR 85 northbound between I-280 and Homestead Road in the AM peak hour
- SR 85 northbound between Homestead Road and Fremont Avenue in the AM peak hour
- SR 85 northbound between Fremont Avenue and El Camino Real in the AM peak hour
- SR 85 northbound between Central Expressway and U.S. 101 in the AM peak hour
- SR 85 southbound between Central Expressway and SR 237 in the PM peak hour

- SR 85 southbound between SR 237 and El Camino Real in the PM peak hour
- SR 85 southbound between El Camino Real and Fremont Avenue in the PM peak hour
- SR 85 southbound between Homestead Road and I-280 in the PM peak hour
- SR 85 southbound south of I-280 in the PM peak hour
- I-280 southbound between SR 85 and De Anza Boulevard in the PM peak hour
- I-280 southbound between De Anza Boulevard and Wolfe Road in the PM peak hour
- I-280 southbound south of Wolfe Road in the PM peak hour
- I-280 northbound south of Wolfe Road in the AM peak hour.

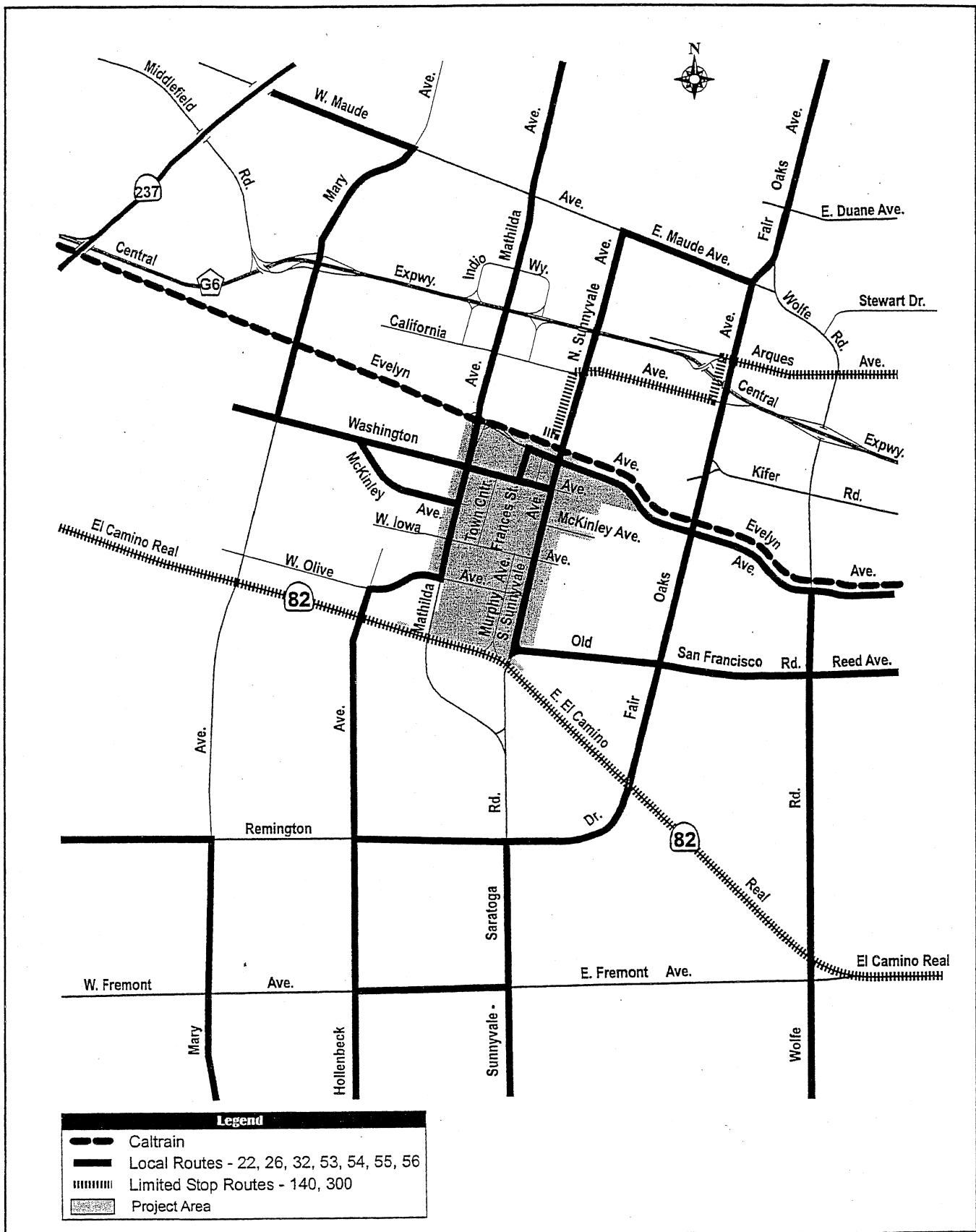
Intersection Level of Service Definitions. The signalized study intersections were evaluated using the TRAFFIX software (Operations Method from the 1985 *Highway Capacity Manual*) as adopted by the Valley Transportation Authority Congestion Management Program (CMP). This method evaluates the amount of green signal time available to each traffic approach and the total intersection capacity used by the traffic demand, and assigns an LOS based on the average delay that drivers would experience at the intersection during the peak hour. The LOS criteria applied in this EIR for signalized intersections are summarized in Table 7.3.

The existing LOS at unsignalized study intersections was also calculated in TRAFFIX software and the conventional methodology from chapter 10 of the 1994 *Highway Capacity Manual*. This methodology evaluates intersection operation based on the average total delay during the peak hour. The LOS criteria for unsignalized intersections are shown in Table 7.4.

The LOS analysis results for the study intersections are summarized in Table 7.5. The City of Sunnyvale's level of service standard for local intersections is LOS D. The level of service standard for CMP intersections is LOS E. The results of the LOS calculations indicate that the intersection of Sunnyvale Avenue and El Camino Real is currently operating at LOS E+ during the PM peak hour, exceeding the City's standards. The other study intersections operate at acceptable levels under existing conditions.

7.1.4 Existing Transit Service

Transit service in the project vicinity includes local and express buses operated by the Santa Clara VTA, and commuter rail service provided by CalTrain. Figure 7.3 depicts the existing bus routes and rail lines serving the project vicinity, which are described below.



SOURCE: CCS Planning and Engineering, Inc.

Figure 7.3

EXISTING TRANSIT ROUTES

Table 7.3

LEVEL OF SERVICE DEFINITIONS--SIGNALIZED INTERSECTIONS

<u>Level of Service</u>	<u>Stopped Delay per Vehicle (in seconds)</u>	<u>Description</u>
A	0 - 5.0	<i>Free/Insignificant Delays:</i> no approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B +	5.1 - 7.0	<i>Stable Operation/Minimal Delays:</i> an occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
B	7.1 - 13.0	
B -	13.1 - 15.0	
C +	15.1 - 17.0	<i>Stable Operation/Acceptable Delays:</i> major approach phases fully utilized. Most drivers feel somewhat restricted.
C	17.1 - 23.0	
C -	23.1 - 25.0	
D +	25.1 - 28.0	<i>Approaching Unstable/Tolerable Delays:</i> some drivers on the worst approaches may have to wait through more than one red signal indication. Queues may develop, but dissipate rapidly without excessive delays.
D	28.1 - 37.0	
D -	37.1 - 40.0	
E +	40.1 - 44.0	<i>Unstable Operation/Significant Delays:</i> volumes at or near capacity. Many vehicles may wait through more than one signal cycle. Long queues form upstream from intersection.
E	44.1 - 56.0	
E -	56.1 - 60.0	
F	> 60.0	<i>Forced Flow/Excessive Delays:</i> represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

SOURCE: *Santa Clara County Congestion Management Program Transportation Impact Analysis Guidelines*; Transportation Research Board, *1985 Highway Capacity Manual, Special Report 209*.

Table 7.4

LEVEL OF SERVICE DEFINITIONS--UNSIGNALIZED INTERSECTIONS

<u>Level of Service</u>	<u>Average Total Delay per Vehicle</u>
A	0 – 5
B	5 – 10
C	10 – 20
D	20 – 30
E	30 – 45
F	> 45

SOURCE: Transportation Research Board, *1994 Highway Capacity Manual, Special Report 209*.

Table 7.5

EXISTING CONDITIONS (SCENARIO 1): INTERSECTION LEVELS OF SERVICE

Intersection ¹	Existing Conditions					
	AM Peak Hour			PM Peak Hour		
	LOS	Delay	V/C	LOS	Delay	V/C
1. Mathilda Ave. and Maude Ave.	C	19	0.68	C	18	0.63
2. Mathilda Ave. and California Ave.	D	31	0.96	C	22	0.86
3. Mathilda Ave. and Washington Ave.	B-	15	0.69	C+	17	0.75
4. Mathilda Ave. and McKinley Ave.	B+	6	0.52	B	8	0.66
5. Mathilda Ave. and Iowa Ave.	B	10	0.55	B-	14	0.67
6. Mathilda Ave. and Olive Ave.	B	9	0.67	B	12	0.66
7. Mathilda Ave. and El Camino Real	C	21	0.74	D	34	0.91
8. Mathilda Ave. and Talisman Dr.	B-	14	0.58	C	19	0.57
9. Sunnyvale Ave. and Evelyn Ave.	B-	15	0.34	B-	15	0.40
10. Sunnyvale Ave. and Washington Ave.	B	11	0.13	B	12	0.34
11. Sunnyvale Ave. and McKinley Ave.	B+	7	0.15	B	9	0.23
12. Sunnyvale Ave. and Iowa Ave.	B	7	0.18	B	10	0.31
13. Sunnyvale Ave. and Olive Ave.	B	11	0.27	B	12	0.38
14. Sunnyvale Ave. and El Camino Real	D	31	0.32	E+	41	0.69
15. Sunnyvale-Saratoga Rd. and Remington Dr.	D	34	0.82	D	33	0.74
16. Sunnyvale-Saratoga Rd. and Fremont Ave.	D	36	0.83	D-	40	0.64
17. Sunnyvale-Saratoga Rd. and Homestead Rd.	D	33	0.79	E	50	1.03
18. Mary Ave. and Central Expwy.	D	35	0.58	D	33	0.77
19. Mary Ave. and Evelyn Ave.	C	20	0.43	C-	24	0.75
20. Mary Ave. and El Camino Real	D	29	0.72	D	35	0.87
21. El Camino Real and Hollenbeck Ave.	D	31	0.41	D	34	0.55
22. El Camino Real and Remington Dr.	E+	43	0.67	E	45	0.69
23. El Camino Real and Wolfe Rd.	D	37	0.68	E+	42	0.69
24. Wolfe Rd. and Fremont Ave.	D	31	0.48	D+	28	0.72
25. Washington Ave. and Town Center Ln.	A	2	0.04	A	4	0.18
26. Washington Ave. and Frances St. (Unsignalized)	A (A) ²	1 (4)	N/A	A (B)	2 (7)	N/A
27. Washington Ave. and Murphy Ave. (Unsignalized)	A (A)	1 (3)	N/A	A (A)	1 (4)	N/A
28. Iowa Ave. and Town Center Ln.	B	11	0.05	B	12	0.14
29. Iowa Ave. and Murphy Ave.	B	10	0.06	B	11	0.11
30. Evelyn Ave. and Frances St.	B	11	0.16	B	12	0.30
31. Evelyn Ave. and Agena Wy.	A	4	0.14	A	5	0.19
32. De Anza Blvd. and I-280 Southbound Ramps	D+	28	0.67	D+	28	0.73
33. De Anza Blvd. and I-280 Northbound Ramps	D+	24	0.71	D+	27	0.75

SOURCE: CCS Planning and Engineering, December 2002.

Notes:

¹ Intersections are numbered according to Figure 7.2.

² For unsignalized intersections: values in parentheses indicate worst-case movement LOS and delay.

(a) Rail Service. CalTrain provides train service between San Francisco and Gilroy. During peak hours, the line operates with a headway of approximately 15 minutes. In the northernmost portion of the project area, the Sunnyvale CalTrain Station is located north of the intersection of Evelyn Avenue and Frances Street.

(b) Bus Service. The following VTA bus routes serve the project vicinity:

Route 22 provides service between Eastridge in San Jose and the Palo Alto/Menlo Park CalTrain station. The route operates 24 hours a day, everyday, with a weekday headway of 10 to 20 minutes during peak hours and a weekend headway of 10 to 70 minutes.

Route 26 provides service between Eastridge in San Jose and the Lockheed Martin campus in Sunnyvale. On weekdays, the route operates between 5:00 AM and 11:30 PM with a headway of 20 minutes during peak hours. On weekends, the route operates from 7:00 AM to 9:30 PM with a headway of 30 to 60 minutes.

Route 32 provides service between the Santa Clara CalTrain Station and San Antonio Shopping Center in Mountain View. On weekdays, the route operates between 5:30 AM and 7:30 PM with a headway of 30 minutes. On Saturdays, the route operates from 9:00 AM to 6:00 PM with a headway of 60 minutes.

Route 53 provides service between the Sunnyvale CalTrain station and Westgate. The route operates on weekdays only, between 6:30 AM and 7:00 PM with a headway of 30 to 60 minutes.

Route 54 provides service between West Valley College in Saratoga and the Lockheed Martin campus in Sunnyvale. On weekdays, the route operates between 5:30 AM and 10:00 PM with a headway of 15 to 20 minutes. On weekends, the route operates from 8:30 AM to 8:00 PM with a headway of 60 minutes.

Route 55 provides service between Great America in Santa Clara and the De Anza College in Cupertino. The route operates on weekdays from 5:30 AM to 10:00 PM with a headway of 15 to 20 minutes during peak hours. On weekends, the route operates from 8:00 AM to 7:30 PM with a headway of 60 minutes.

Route 56 provides service between Fair Oaks and El Camino Real in Sunnyvale and Milpitas. The route operates on weekdays only, from 5:30 AM to 6:30 PM, with a headway of 30 to 40 minutes during peak hours.

Route 140 is an express bus route that provides service between the Fremont Bay Area Rapid Transit (BART) station and the Sunnyvale CalTrain station. The route operates on weekdays only, from 6:00 AM to 8:30 AM and 4:00 PM to 6:30 PM, with a headway of 30 to 45 minutes.

It should be noted that the Valley Transportation Authority is currently experiencing a period of fiscal uncertainty which portends yet-to-be-identified service cuts in the near future, which may in turn affect bus service in the project area vicinity.

7.1.5 Existing Pedestrian and Bicycle Facilities

(a) Pedestrian Facilities. Pedestrian sidewalks are provided on both sides of most streets in downtown Sunnyvale. Crosswalks and pedestrian signals are located at all key signalized intersections. Crosswalks are also provided at unsignalized intersections in the downtown.

(b) Bicycle Facilities. Existing downtown bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from roadways. Bike lanes are lanes on roadways designated for use by bicycles by striping, pavement legends, and signs. Bike routes are vehicular roadways that are designated (with signs) for bicycle use.

There are no bicycle facilities in the immediate project vicinity north of El Camino Real. Bicycle lanes are currently located on:

- Mathilda Avenue south of El Camino Real,
- Sunnyvale-Saratoga Road south of El Camino Real,
- Remington Drive between El Camino Real and Sunnyvale-Saratoga Road,
- Fremont Avenue,
- Old San Francisco Road east of Sunnyvale Avenue,
- Hollenbeck Avenue between El Camino Real and Danforth,
- Old San Francisco Road from Sunnyvale Avenue east,
- Fair Oaks Avenue from Evelyn Avenue to Kifer Road,
- Kifer Road from Fair Oaks Avenue east,
- Mary Avenue north of Maude Avenue,
- Arques Avenue east of Fair Oaks Avenue,
- Wolfe Road between Stewart Drive and Fair Oaks Avenue,

Further from the project area, bicycle facilities are provided on the Central Expressway.

7.1.6 Scenario 2: Year 2020 No Project (Current General Plan) Conditions

This subsection describes traffic conditions on the local roadway system under existing conditions plus traffic from approved but not yet constructed developments in the project vicinity plus projected citywide General Plan buildout (but not including the proposed project evaluated in this EIR), with planned and funded roadway modifications in place.

(a) Assumed Future Roadway Modifications. This EIR analysis of 2020 No Project Conditions assumes completion of the Mary Avenue Extension from Maude Avenue over U.S. 101 and SR 237 to H Street in the Moffett Park area. All roadway projects that are committed in the *Valley Transportation Plan (VTP) Capital Investment Program* in Santa Clara County have also been included in the analysis. In Sunnyvale, these improvements include new HOV lanes on Central Expressway and SR 237, and interchange improvements at the junctions of SR 85 with U.S. 101 and I-280. These VTP-identified roadway modification projects are funded and are assumed to be completed within the time frame of the project.

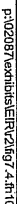
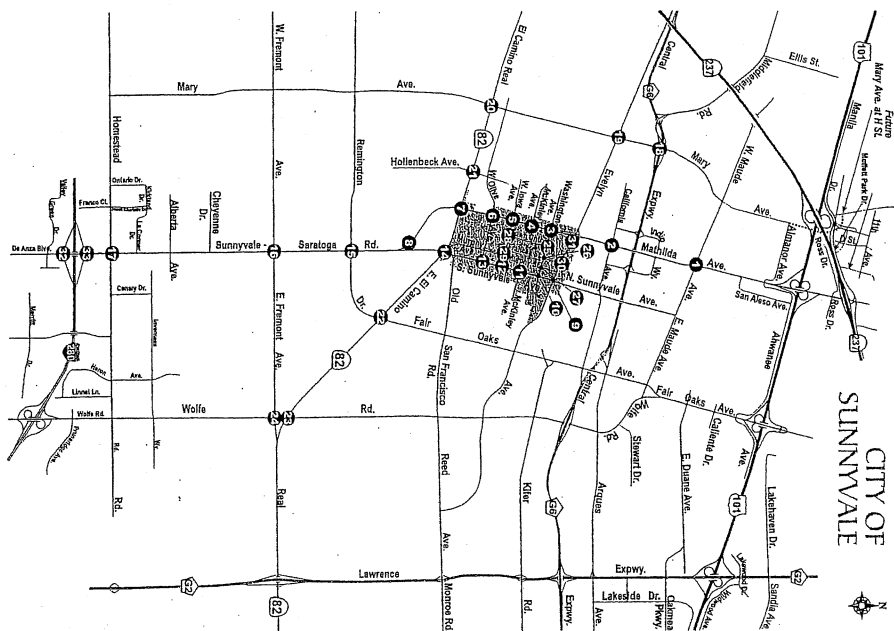
The 2020 No Project Conditions scenario also assumes completion of the following planned Sunnyvale roadway system improvements which are currently budgeted or in progress:

- improvements to the Mathilda Avenue/Washington Avenue intersection
- traffic signal and geometric improvements along Mathilda Avenue
- traffic signal and geometric improvements at the Mathilda Avenue/CalTrain bridge

(b) 2020 No Project Conditions Traffic Estimates. Figure 7.4 presents the traffic volumes estimated at the study intersections under 2020 No Project Conditions, using the City's 2002 traffic forecasting model. The model was designed to respond to local land use policies, accurately reflect the effects of congestion and constraints on the road network, and provide reliable traffic forecasts. The model is based closely on the Santa Clara County CMP regional travel model developed by the Center for Urban Analysis (CUA) and maintained by the Santa Clara VTA. The Sunnyvale model uses many of the same procedures and assumptions as the CMP model, but includes a more detailed traffic network and traffic zone system, as well as more detailed land use types to define trip generation within the city.

Land use and socioeconomic data at the traffic zone level were used to determine trip generation in the Sunnyvale model. The City of Sunnyvale maintains an extensive parcel-specific database that includes nearly 30 land use categories and subcategories. The land use data were input to the model to determine existing conditions. Traffic volumes over the roadway network were forecast by the model, and the turn movement volumes were obtained based on recent intersection counts at the study intersections.

Future land use assumptions for Sunnyvale estimated by the City of Sunnyvale Planning Department were used as input to the model to determine the 2020 No Project Conditions.



2020 NO PROJECT CONDITIONS
PEAK-HOUR INTERSECTION VOLUMES AND LANE GEOMETRY

The future land use assumptions were based on buildout of allowable and anticipated development under the City of Sunnyvale General Plan and associated zoning.

The differences between Existing (Scenario 1) and 2020 No Project Conditions (Scenario 2) traffic volumes for each study freeway segment were calculated. This traffic growth increment was added to the existing freeway volumes for each respective segment to estimate the 2020 No Project Conditions freeway volumes. For segments that resulted in negative increments--i.e., when the projected 2020 traffic levels were less than existing levels, the traffic volumes were assumed to remain at the higher existing volumes in order to evaluate the most conservative case, consistent with the CEQA Guidelines.

The increment between the Existing and 2020 No Project Conditions traffic volumes was also calculated for each turn movement at each study intersection except the Central Expressway/Mary Avenue intersection, where the year 2020 No Project Conditions traffic volume estimate was taken from the VTA *Comprehensive Countywide Expressway Study*. For each study intersection (except Central Expressway/Mary Avenue), the traffic growth increment was added to traffic count volumes taken in 1998 to estimate the 2020 No Project Conditions intersection volumes. Again, for traffic movements that had negative increments, the traffic volumes were assumed to remain at the higher 1998 levels in order to evaluate the most conservative case.

(c) 2020 No Project Conditions Freeway Levels of Service. Tables 7.6 and 7.7 present freeway segment LOS calculation results for 2020 No Project Conditions under AM and PM peak hour conditions, respectively. According to the CMP Guidelines, freeway segments are impacted when LOS is downgraded from E or better to F. Freeway segments operating at LOS F under Existing or future No Project Conditions are impacted if the number of new trips added by the project is more than one (1) percent of the freeway capacity. Based on this criterion, the following freeway segments would be impacted under Scenario 2: 2020 No Project Conditions:

- U.S. 101 northbound south of Montague Expressway in the AM peak hour
- U.S. 101 northbound between SR 237 and Ellis Street in the both the AM and PM peak hours
- U.S. 101 northbound between Ellis Street and Moffett Boulevard in both the AM and PM peak hours
- U.S. 101 northbound between Moffett Boulevard and SR 85 in the AM peak hour
- U.S. 101 northbound between SR 85 and Shoreline Boulevard in the PM peak hour
- U.S. 101 northbound north of Shoreline Boulevard in the AM peak hour

Table 7.6

2020 NO PROJECT CONDITIONS (SCENARIO 2): FREEWAY OPERATIONS--AM PEAK HOUR

Freeway	Segment	Lanes	Capacity	Existing (2000)		2020 No Project		% Impact
				Existing Trips	LOS	Increment Trips	LOS	
101 NB	South of Montague Expwy.	3 Mixed ¹	6,900	5,460	F	361	F	5.2%
	Montague Expwy. to Bower Ave.	1 HOV ²	2,300	1,790	E	295	F	12.8%
		3 Mixed	6,900	6,300	D	731	E	
	Bower Ave. to Lawrence Expwy.	1 HOV	2,300	2,040	C	113	D	
		3 Mixed	6,900	5,940	C	807	D	
	Lawrence Expwy. to Fair Oaks Ave.	1 HOV	2,300	1,860	B	105	D	
		3 Mixed	6,900	4,860	A	557	D	
	Fair Oaks Ave. to Mathilda Ave.	1 HOV	2,300	1,170	A	242	C	
		3 Mixed	6,900	6,770	D	775	D	
	Mathilda Ave. to Route 237	1 HOV	2,300	1,440	A	0	C	0.0%
		3 Mixed	6,900	4,740	F	0	F	
	Route 237 to Ellis St.	1 HOV	2,300	1,790	F	0	E	
		3 Mixed	6,900	3,960	F	664	F	9.6%
	Ellis St. to Moffett Blvd.	1 HOV	2,300	1,440	F	0	F	0.0%
		3 Mixed	6,900	3,960	F	999	F	14.5%
	Moffett Blvd. to Route 85	1 HOV	2,300	1,440	F	0	F	0.0%
		3 Mixed	6,900	3,690	F	257	F	3.7%
	Route 85 to Shoreline Blvd.	1 HOV	2,300	1,340	F	0	F	0.0%
		3 Mixed	6,900	4,200	F	0	F	0.0%
	North of Shoreline Blvd.	1 HOV	2,300	2,100	D	0	D	0.0%
		3 Mixed	6,900	4,500	F	0	F	0.0%
		1 HOV	2,300	2,200	D	11	D	
101 SB	North of Shoreline Blvd.	3 Mixed	6,900	4,260	F	0	F	0.0%
		1 HOV	2,300	1,980	C	53	D	
	Shoreline Blvd. to Route 85	3 Mixed	6,900	5,460	F	0	E	
		1 HOV	2,300	1,930	B	380	D	
	Route 85 to Moffett Blvd.	3 Mixed	6,900	6,900	D	0	D	
		1 HOV	2,300	1,800	B	0	D	
	Moffett Blvd. to Ellis St.	3 Mixed	6,900	4,950	F	81	F	1.2%
		1 HOV	2,300	1,620	A	0	D	
	Ellis St. to Route 237	3 Mixed	6,900	4,950	F	0	D	0.0%
		1 HOV	2,300	1,620	A	0	D	
	Route 237 to Mathilda Ave.	3 Mixed	6,900	6,450	D	0	D	
		1 HOV	2,300	1,680	B	0	D	
	Mathilda Ave. to Fair Oaks Ave.	3 Mixed	6,900	6,300	D	0	D	
		1 HOV	2,300	1,680	B	0	D	
	Fair Oaks Ave. to Lawrence Expwy.	3 Mixed	6,900	6,300	B	0	D	
		1 HOV	2,300	1,680	E	181	E	
	Lawrence Expwy. to Bower Ave.	3 Mixed	6,900	5,880	B	45	D	
		1 HOV	2,300	1,740	E	239	E	
	Bower Ave. to Montague Expwy.	3 Mixed	6,900	5,880	A	18	B	
		1 HOV	2,300	780	B	366	D	
	South of Montague Expwy.	3 Mixed	6,900	5,760	A	0	B	
		1 HOV	2,300	1,040	A	0	D	
		3 Mixed	6,900	4,680	A	530	D	
		1 HOV	2,300	850	A	0	B	

Table 7.6 (continued)

Freeway	Segment	Lanes	Capacity	Existing (2000) Trips	LOS	2020 No Project Increment Trips	LOS	% Impact
237 EB	West of Route 85 (to El Camino Real)	2 Total (Mixed) ³	4,600	2,760	A	98	C	
		1 (HOV)	2,300	488 ⁴	A	17	A	
	Route 85 to Central Expwy.	2 Total (Mixed)	4,600	2,960	F	581	F	12.6%
		1 (HOV)	2,300	841	B	165	B	
	Central Expwy. to Maude Ave.	2 Total (Mixed)	4,600	3,180	F	828	F	18.0%
		1 (HOV)	2,300	774	B	202	B	
	Maude Ave. to U.S. 101	2 Total (Mixed)	4,600	3,250	F	821	F	17.8%
		1 (HOV)	2,300	559	A	141	A	
	U.S. 101 to Mathilda Ave.	2 Total (Mixed)	4,600	2,610	F	525	F	11.4%
		1 (HOV)	2,300	386	A	78	A	
	Mathilda Ave. to Fair Oaks Ave.	2 Mixed	4,600	3,400	F	124	F	2.7%
		1 HOV	2,300	1,620	A	168	D	
	Fair Oaks Ave. to Lawrence Expwy.	2 Mixed	4,600	4,500	D	45	D	
		1 HOV	2,300	2,040	B	26	D	
	Lawrence Expwy. to Great America Pkwy.	2 Mixed	4,600	3,180	F	0	E	
237 WB		1 HOV	2,300	1,680	B	38	D	
	Great America Pkwy. to N. First St.	2 Mixed	4,600	3,640	F	0	E	
		1 HOV	2,300	1,170	A	85	C	
	East of N. First St.	2 Mixed	4,600	3,960	B	0	D	
		1 HOV	2,300	910	A	138	C	
	East of N. First St.	2 Mixed	4,600	4,300	D	0	D	
		1 HOV	2,300	1,560	A	763	D	
	N. First St. to Great America Pkwy.	2 Mixed	4,600	3,850	B	354	D	
		1 HOV	2,300	1,740	B	888	D	
	Great America Pkwy. to Lawrence Expwy.	2 Mixed	4,600	3,240	A	426	D	
		1 HOV	2,300	1,380	A	771	D	
	Lawrence Expwy. to Fair Oaks Ave.	2 Mixed	4,600	3,480	B	701	D	
		1 HOV	2,300	1,800	B	751	D	
	Fair Oaks Ave. to Mathilda Ave.	2 Total (Mixed)	4,600	3,950	A	1,231	D	
		1 (HOV)	2,300	766	B	239	B	
85 NB	Mathilda Ave. to U.S. 101	2 Total (Mixed)	4,600	3,720	B	857	D	
		1 (HOV)	2,300	567	A	131	B	
	U.S. 101 to Maude Ave.	2 Total (Mixed)	4,600	3,120	A	841	D	
		1 (HOV)	2,300	615	A	166	B	
	Maude Ave. to Central Expwy.	2 Total (Mixed)	4,600	1,690	A	598	C	
		1 (HOV)	2,300	435	A	154	A	
	Central Expwy. to Route 85	2 Total (Mixed)	4,600	2,640	A	145	C	
		1 (HOV)	2,300	602	A	33	A	
	West of Route 85 (to El Camino Real)	2 Total (Mixed)	4,600	3,960	C	132	D	
		1 (HOV)	2,300	900	B	30	B	
	South of I-280	2 Mixed	4,600	2,320	F	549	F	11.9%
		1 HOV	2,300	910	A	571	C	
	I-280 to Homestead Rd.	2 Mixed	4,600	3,660	F	318	F	6.9%
		1 HOV	2,300	2,040	B	652	D	
	Homestead Rd. to Fremont Blvd.	2 Mixed	4,600	2,280	F	332	F	7.2%
		1 HOV	2,300	1,680	B	638	D	
	Fremont Blvd. to El Camino Real	2 Mixed	4,600	3,450	F	192	F	4.2%
		1 HOV	2,300	1,040	A	601	D	

Table 7.6 (continued)

Freeway	Segment	Lanes	Capacity	Existing (2000)		2020 No Project		% Impact
				Existing Trips	LOS	Increment Trips	LOS	
85 SB	El Camino Real to Route 237	2 Mixed 1 HOV	4,600 2,300	4,320 590	E A	744 303	F B	16.2%
	Route 237 to Central Expwy.	2 Mixed 1 HOV	4,600 2,300	3,850 1,110	B A	396 134	D C	
	North of Central Expwy. (to U.S. 101)	2 Mixed 1 HOV	4,600 2,300	3,160 980	F A	779 224	F C	16.9%
	North of Central Expwy. (to U.S. 101)	2 Mixed 1 HOV	4,600 2,300	1,560 780	A A	0 0	B B	
	Central Expwy. To Route 237	2 Mixed 1 HOV	4,600 2,300	1,950 1,110	A A	51 14	B C	
	Route 237 to El Camino Real	2 Mixed 1 HOV	4,600 2,300	3,000 1,170	A A	213 159	D C	
	El Camino Real to Fremont Blvd.	2 Mixed 1 HOV	4,600 2,300	2,640 1,200	A A	323 148	C D	
	Fremont Blvd. to Homestead Rd.	2 Mixed 1 HOV	4,600 2,300	4,180 850	C A	436 150	D B	
	Homestead Rd. to I-280	2 Mixed 1 HOV	4,600 2,300	1,690 1,560	A A	282 174	B D	
	South of I-280	2 Mixed 1 HOV	4,600 2,300	2,700 260	A A	671 77	D A	
I-280 EB	West of Route 85	3 Mixed 1 HOV	6,900 2,300	6,120 330	B A	341 73	D A	
	Route 85 to De Anza Blvd.	3 Mixed 1 HOV	6,900 2,300	5,780 390	B A	319 46	D A	
	De Anza Blvd. to Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	6,440 520	C A	338 44	D A	
	East of Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	5,400 780	B A	299 163	D B	
	East of Wolfe Rd.	3 Mixed 1 HOV	6,900 2,300	4,260 2,150	F C	135 190	F D	2.0%
	Wolfe Rd. to De Anza Blvd.	3 Mixed 1 HOV	6,900 2,300	4,650 1,740	F B	367 101	F D	5.3%
	De Anza Blvd. to Route 85	3 Mixed 1 HOV	6,900 2,300	5,940 850	B A	67 109	D B	
	West of Route 85	3 Mixed 1 HOV	6,900 2,300	4,950 1,440	F A	297 161	F D	4.3%

SOURCE: CCS Planning and Engineering, December 2002.

Notes:

¹ Mixed = mixed-flow (unrestricted) lane.

² HOV = high-occupancy vehicle (car pool) lane.

³ Facility type in parenthesis indicates future condition.

⁴ "Existing" volumes on future HOV facilities, shown underlined, based on ratio from model and assumed to operate at average speed of 65 mph.

Table 7.7
2020 NO PROJECT CONDITIONS (SCENARIO 2): FREEWAY OPERATIONS--PM PEAK HOUR

Freeway	Segment	Lanes	Capacity	Existing (2000)		2020 No Project		% Impact
				Existing Trips	LOS	Increment Trips	LOS	
101 NB	South of Montague Expwy.	3 Mixed ¹	6,900	5,940	B	612	D	
		1 HOV ²	2,300	850	A	106	B	
	Montague Expwy. to Bower Ave.	3 Mixed	6,900	5,940	C	602	D	
		1 HOV	2,300	1,110	A	0	C	
	Bower Ave. to Lawrence Expwy.	3 Mixed	6,900	6,600	C	0	D	
		1 HOV	2,300	850	A	0	B	
	Lawrence Expwy. to Fair Oaks Ave.	3 Mixed	6,900	5,220	B	491	D	
		1 HOV	2,300	1,040	A	85	C	
	Fair Oaks Ave. to Mathilda Ave.	3 Mixed	6,900	4,500	A	162	D	
		1 HOV	2,300	910	A	0	B	
	Mathilda Ave. to Route 237	3 Mixed	6,900	5,040	B	0	D	
		1 HOV	2,300	1,200	A	0	C	
	Route 237 to Ellis St.	3 Mixed	6,900	4,500	F	113	F	1.6%
		1 HOV	2,300	1,380	A	0	C	
	Ellis St. to Moffett Blvd.	3 Mixed	6,900	4,500	F	162	F	2.3%
		1 HOV	2,300	1,380	A	0	C	
	Moffett Blvd. to Route 85	3 Mixed	6,900	4,550	F	0	F	0.0%
		1 HOV	2,300	1,960	E	0	E	
	Route 85 to Shoreline Blvd.	3 Mixed	6,900	4,350	F	0	F	0.0%
		1 HOV	2,300	1,320	A	0	C	
	North of Shoreline Blvd.	3 Mixed	6,900	4,500	F	5	F	0.1%
		1 HOV	2,300	1,980	B	0	D	
101 SB	North of Shoreline Blvd.	3 Mixed	6,900	3,870	F	0	F	0.0%
		1 HOV	2,300	2,040	C	0	D	
	Shoreline Blvd. to Route 85	3 Mixed	6,900	5,360	E	0	E	
		1 HOV	2,300	1,800	B	295	D	
	Route 85 to Moffett Blvd.	3 Mixed	6,900	5,940	C	0	D	
		1 HOV	2,300	1,440	A	0	C	
	Moffett Blvd. to Ellis St.	3 Mixed	6,900	5,940	C	384	D	
		1 HOV	2,300	1,260	A	0	C	
	Ellis St. to Route 237	3 Mixed	6,900	5,940	C	454	D	
		1 HOV	2,300	1,260	A	0	C	
	Route 237 to Mathilda Ave.	3 Mixed	6,900	5,220	B	52	D	
		1 HOV	2,300	1,320	A	0	C	
	Mathilda Ave. to Fair Oaks Ave.	3 Mixed	6,900	3,360	F	637	F	9.2%
		1 HOV	2,300	1,040	A	0	B	
	Fair Oaks Ave. to Lawrence Expwy.	3 Mixed	6,900	4,050	F	308	F	4.5%
		1 HOV	2,300	1,170	A	332	C	
	Lawrence Expwy. to Bower Ave.	3 Mixed	6,900	3,210	F	654	F	9.5%
		1 HOV	2,300	1,860	B	344	D	
	Bower Ave. to Montague Expwy.	3 Mixed	6,900	3,840	F	592	F	8.6%
		1 HOV	2,300	1,560	F	226	F	9.8%
	South of Montague Expwy.	3 Mixed	6,900	3,480	F	676	F	9.8%
		1 HOV	2,300	1,380	F	253	F	11.0%

Table 7.7 (continued)

Freeway	Segment	Lanes	Capacity	Existing (2000)		2020 No Project		% Impact
				Existing Trips	LOS	Increment Trips	LOS	
237 EB	West of Route 85 (to El Camino Real)	2 Total (Mixed) ³ 1 (HOV)	4,600 2,300	2,760 687	A B	241 60	D B	
	Route 85 to Central Expwy.	2 Total (Mixed) 1 (HOV)	4,600 2,300	2,470 356	C A	347 50	C A	
	Central Expwy. to Maude Ave.	2 Total (Mixed) 1 (HOV)	4,600 2,300	1,690 518	A A	672 206	C D	
	Maude Ave. to U.S. 101	2 Total (Mixed) 1 (HOV)	4,600 2,300	1,690 340	A A	830 167	C C	
	U.S. 101 to Mathilda Ave.	2 Total (Mixed) 1 (HOV)	4,600 2,300	2,760 408	A A	763 113	D A	
	Mathilda Ave. to Fair Oaks Ave.	2 Mixed 1 HOV	4,600 2,300	2,400 650	A A	609 378	D B	
	Fair Oaks Ave. to Lawrence Expwy.	2 Mixed 1 HOV	4,600 2,300	2,520 460	A A	428 451	D B	
	Lawrence Expwy. to Great America Pkwy.	2 Mixed 1 HOV	4,600 2,300	3,120 850	A A	325 427	D C	
	Great America Pkwy. to N. First St.	2 Mixed 1 HOV	4,600 2,300	3,480 1,040	B A	233 547	D D	
	East of N. First St.	2 Mixed 1 HOV	4,600 2,300	3,350 910	F A	102 510	F C	2.2%
237 WB	East of N. First St.	2 Mixed 1 HOV	4,600 2,300	3,850 590	B A	0 58	D A	
	N. First St. to Great America Pkwy.	2 Mixed 1 HOV	4,600 2,300	4,230 850	E A	0 106	E B	
	Great America Pkwy. to Lawrence Expwy.	2 Mixed 1 HOV	4,600 2,300	4,070 460	C A	0 72	D A	
	Lawrence Expwy. to Fair Oaks Ave.	2 Mixed 1 HOV	4,600 2,300	3,960 1,240	B A	0 88	D C	
	Fair Oaks Ave. to Mathilda Ave.	2 Total (Mixed) 1 (HOV)	4,600 2,300	4,430 714	B B	171 27	D B	
	Mathilda Ave. to U.S. 101	2 Total (Mixed) 1 (HOV)	4,600 2,300	4,180 582	C A	471 65	D A	
	U.S. 101 to Maude Ave.	2 Total (Mixed) 1 (HOV)	4,600 2,300	4,290 712	A B	622 103	D B	
	Maude Ave. to Central Expwy.	2 Total (Mixed) 1 (HOV)	4,600 2,300	2,820 465	F A	675 111	F A	14.7%
	Central Expwy. to Route 85	2 Total (Mixed) 1 (HOV)	4,600 2,300	3,320 463	F A	106 15	F A	2.3%
	West of Route 85 (to El Camino Real)	2 Total (Mixed) 1 (HOV)	4,600 2,300	3,450 467	F A	70 9	F A	1.5%
85 NB	South of I-280	2 Mixed 1 HOV	4,600 2,300	1,690 330	A A	596 146	C A	
	I-280 to Homestead Rd.	2 Mixed 1 HOV	4,600 2,300	2,340 260	A A	462 157	C A	
	Homestead Rd. to Fremont Blvd.	2 Mixed 1 HOV	4,600 2,300	4,080 390	B A	480 139	D A	

Table 7.7 (continued)

Freeway	Segment	Lanes	Capacity	Existing (2000)		2020 No Project		% Impact
				Existing Trips	LOS	Increment Trips	LOS	
85 SB	Fremont Blvd. to El Camino Real	2 Mixed	4,600	3,000	A	468	D	
	1 HOV	1 HOV	2,300	260	A	109	A	
	2 Mixed	2 Mixed	4,600	1,950	A	448	C	
	1 HOV	1 HOV	2,300	130	A	0	A	
	2 Mixed	2 Mixed	4,600	2,340	A	276	C	
	1 HOV	1 HOV	2,300	260	A	75	A	
	2 Mixed	2 Mixed	4,600	2,080	A	714	C	
	1 HOV	1 HOV	2,300	520	A	225	B	
	2 Mixed	2 Mixed	4,600	3,450	F	0	F	0.0%
	1 HOV	1 HOV	2,300	780	A	0	B	
	Central Expwy. To Route 237	2 Mixed	4,600	2,420	F	7	F	0.2%
	1 HOV	1 HOV	2,300	1,170	A	4	C	
	2 Mixed	2 Mixed	4,600	2,740	F	0	F	0.0%
	1 HOV	1 HOV	2,300	1,560	A	659	D	
	2 Mixed	2 Mixed	4,600	3,000	F	149	F	3.2%
	1 HOV	1 HOV	2,300	1,800	B	526	D	
	2 Mixed	2 Mixed	4,600	2,750	F	293	F	6.4%
	1 HOV	1 HOV	2,300	1,500	A	479	D	
	2 Mixed	2 Mixed	4,600	4,070	C	254	D	
	1 HOV	1 HOV	2,300	910	A	524	C	
I-280 EB	South of I-280	2 Mixed	4,600	4,260	F	491	F	10.7%
	1 HOV	1 HOV	2,300	1,440	A	477	D	
	3 Mixed	3 Mixed	6,900	4,920	F	650	F	9.4%
	1 HOV	1 HOV	2,300	1,380	A	135	D	
	3 Mixed	3 Mixed	6,900	4,280	F	412	F	6.0%
	1 HOV	1 HOV	2,300	1,170	A	131	C	
	3 Mixed	3 Mixed	6,900	4,500	F	408	F	5.9%
	1 HOV	1 HOV	2,300	1,260	A	136	C	
	3 Mixed	3 Mixed	6,900	6,750	D	149	D	
	1 HOV	1 HOV	2,300	1,320	A	369	D	
I-280 WB	East of Wolfe. Rd.	3 Mixed	6,900	5,580	B	4	D	
	1 HOV	1 HOV	2,300	520	A	110	A	
	3 Mixed	3 Mixed	6,900	5,760	B	0	D	
	1 HOV	1 HOV	2,300	720	A	79	B	
	3 Mixed	3 Mixed	6,900	4,500	A	0	D	
	1 HOV	1 HOV	2,300	520	A	118	A	
	3 Mixed	3 Mixed	6,900	5,940	C	89	D	
	1 HOV	1 HOV	2,300	460	A	279	B	
	3 Mixed	3 Mixed	6,900	5,580	B	4	D	
	1 HOV	1 HOV	2,300	520	A	110	A	

SOURCE: CCS Planning and Engineering, December 2002.

Notes:

¹ Mixed = mixed-flow (unrestricted) lane.

² HOV = high-occupancy vehicle (car pool) lane.

³ Facility type in parenthesis indicates future condition.

⁴ "Existing" volumes on future HOV facilities, shown underlined, based on ratio from model and assumed to operate at average speed of 65 mph.

- U.S. 101 southbound between Moffett Boulevard and Ellis Street in the AM peak hour
- U.S. 101 southbound between Ellis Street and SR 237 in the AM peak hour
- U.S. 101 southbound between Mathilda Avenue and Fair Oaks Avenue in the PM peak hour
- U.S. 101 southbound between Fair Oaks Avenue and Lawrence Expressway in the PM peak hour
- U.S. 101 southbound between Lawrence Expressway and Bowers Avenue in the PM peak hour
- U.S. 101 southbound between Bowers Avenue and Montague Expressway in the PM peak hour
- U.S. 101 southbound south of Montague Expressway in the PM peak hour
- SR 237 eastbound between SR 85 and Central Expressway in the AM peak hour
- SR 237 eastbound between Central Expressway and Maude Avenue in the AM peak hour
- SR 237 eastbound between Maude Avenue and U.S. 101 in the AM peak hour
- SR 237 eastbound between U.S. 101 and Mathilda Avenue in the AM peak hour
- SR 237 eastbound between Mathilda Avenue and Fair Oaks Avenue in the AM peak hour
- SR 237 eastbound east of North First Street in the PM peak hour
- SR 237 westbound between Maude Avenue and Central Expressway in the PM peak hour
- SR 237 westbound between Central Expressway and SR 85 in the PM peak hour
- SR 237 westbound between SR 85 and El Camino Real in the PM peak hour
- SR 85 northbound south of I-280 in the AM peak hour
- SR 85 northbound between I-280 and Homestead Road in the AM peak hour
- SR 85 northbound between Homestead Road and Fremont Avenue in the AM peak hour
- SR 85 northbound between Fremont Avenue and El Camino Real in the AM peak hour

- SR 85 northbound between El Camino Real and SR 237 in the AM peak hour
- SR 85 northbound between Central Expressway and U.S. 101 in the AM peak hour
- SR 85 southbound between U.S. 101 and Central Expressway in the PM peak hour
- SR 85 southbound between El Camino Real and Fremont Avenue in the PM peak hour
- SR 85 southbound between Fremont Avenue and Homestead Road in the PM peak hour
- SR 85 southbound south of I-280 in the PM peak hour
- I-280 southbound north of SR 85 in the PM peak hour
- I-280 southbound between SR 85 and De Anza Boulevard in the PM peak hour
- I-280 southbound between De Anza Boulevard and Wolfe Road in the PM peak hour
- I-280 northbound south of Wolfe Road in the AM peak hour
- I-280 northbound between Wolfe Road and De Anza Boulevard in the AM peak hour
- I-280 northbound north of SR 85 in the AM peak hour.

(d) 2020 No Project Conditions Intersection Levels of Service. Table 7.8 presents study intersection LOS calculation results for 2020 No Project Conditions under AM and PM peak hour conditions, respectively. Traffic volumes at the study intersections under the 2020 No Project Conditions are shown on Figure 7.4. A CMP intersection is said to be impacted if a project causes an intersection operating at LOS E or better under Existing or No Project Conditions to operate at LOS F with the addition of the project. An intersection operating at LOS F under Existing or No Project Conditions is impacted if the traffic added by the project increases the average stopped delay for critical movements by four seconds or more **and** increases the critical volume-to-capacity (v/c) ratio by 0.01 or more. Under City of Sunnyvale criteria, local non-CMP intersections are impacted when LOS are downgraded from LOS D to LOS E or F. The following intersections (numbered according to Figure 7.5) would be impacted under 2020 No Project Conditions:

- 2. Mathilda Avenue & California Avenue during both peak hours
- 17. De Anza Boulevard & Homestead Road in the PM peak hour
- 18. Mary Avenue & Central Expressway during both peak hours (CMP Intersection)

Table 7.8

2020 NO PROJECT CONDITIONS (SCENARIO 2): INTERSECTION LEVELS OF SERVICE

Intersection ¹	2020 No Project Conditions					
	AM Peak Hour			PM Peak Hour		
	LOS	Delay	V/C	LOS	Delay	V/C
1. Mathilda Ave. and Maude Ave.	C-	25	0.85	E	46	1.02
2. Mathilda Ave. and California Ave.	D	35	0.90	D	35	0.90
3. Mathilda Ave. and Washington Ave.	C	18	0.85	C	23	0.89
4. Mathilda Ave. and McKinley Ave.	B	7	0.60	B	10	0.75
5. Mathilda Ave. and Iowa Ave.	B	11	0.64	C	19	0.86
6. Mathilda Ave. and Olive Ave.	C	19	0.90	B-	13	0.74
7. Mathilda Ave. and El Camino Real	D+	26	0.84	D	31	0.95
8. Mathilda Ave. and Talisman Dr.	C+	16	0.71	D+	26	0.76
9. Sunnyvale Ave. and Evelyn Ave.	C+	17	0.69	C	21	0.77
10. Sunnyvale Ave. and Washington Ave.	B	9	0.30	B-	13	0.60
11. Sunnyvale Ave. and McKinley Ave.	B	7	0.33	B	10	0.41
12. Sunnyvale Ave. and Iowa Ave.	B	8	0.37	B	9	0.50
13. Sunnyvale Ave. and Olive Ave.	B	11	0.48	B	10	0.55
14. Sunnyvale Ave. and El Camino Real	D-	40	0.53	E	54	0.95
15. Sunnyvale-Saratoga Rd. and Remington Dr.	E	47	0.83	E+	42	0.72
16. Sunnyvale-Saratoga Rd. and Fremont Ave.	E	52	1.01	E+	41	0.91
17. De Anza Boulevard and Homestead Rd.	E	49	1.03	E-	59	1.07
18. Mary Ave. and Central Expwy.	F	98	1.18	F	98	1.16
19. Mary Ave. and Evelyn Ave.	D+	27	0.88	E-	57	1.00
20. Mary Ave. and El Camino Real	D	36	0.95	F	81	1.13
21. El Camino Real and Hollenbeck Ave.	E+	43	0.72	C	22	0.67
22. El Camino Real and Remington Dr.	E+	44	0.72	E	49	0.81
23. El Camino Real and Wolfe Rd.	E	51	0.97	E	48	0.88
24. Wolfe Rd. and Fremont Ave.	D	36	0.55	D	32	0.85
25. Washington Ave. and Town Center Ln.	B+	6	0.09	B	9	0.31
26. Washington Ave. and Frances St. (Unsignalized)	A (A)	1 (5)	N/A	A (B)	2 (8)	N/A
27. Washington Ave. and Murphy Ave. (Unsignalized)	A (A)	1 (5)	N/A	A (B)	1 (6)	N/A
28. Iowa Ave. and Town Center Ln.	B	12	0.14	B	12	0.33
29. Iowa Ave. and Murphy Ave.	B	7	0.09	B	10	0.16
30. Evelyn Ave. and Frances St.	B-	14	0.27	C+	17	0.57
31. Evelyn Ave. and Agena Wy.	A	4	0.28	A	4	0.39
32. De Anza Blvd. and I-280 Southbound Ramps	D	37	0.94	E+	43	1.03
33. De Anza Blvd. and I-280 Northbound Ramps	D	32	0.88	D	29	0.86

SOURCE: CCS Planning and Engineering, December 2002.

Notes:

¹ Intersections are numbered according to Figure 7.5.

² Impacts are designated in **BOLD ITALIC** type.

³ For unsignalized intersections: values in parentheses indicate worst-case movement LOS and delay.